

CLAIMS

What is claimed is:

1. A miter saw, comprising:
 - a base having a support surface for at least partially supporting a workpiece;
 - a workpiece positioning fence coupled to the base, said positioning fence being orientated substantially perpendicular to the support surface; and
 - a cutting assembly pivotally mounted on the miter saw to achieve a plurality of positions, said cutting assembly including:
 - a motor orientated substantially perpendicular to an arbor for rotating a circular saw blade; and
 - a gear assembly configured and arranged to transfer the rotational energy of the motor to the arbor,

wherein the gear assembly and motor are configured so as to not contact the workpiece position fence when the cutting assembly is disposed at the cutting assembly's closest position to the base when mitering at least a 45° (forty-five degree) from a plane substantially perpendicular to the workpiece positioning fence.
2. The miter saw of claim 1, wherein the gear assembly includes a helical gear set coupled to the motor and a bevel gear set between the helical gear set and the arbor.
3. The miter saw of claim 1, wherein the gear assembly includes a helical gear set coupled to the motor and a jack shaft extending between the helical gear set and a bevel gear set coupled to the arbor.
4. The miter saw of claim 1, further comprising a gear box for enclosing the gear assembly, said gear box being tapered in the direction of the base.

5. The miter saw of claim 1, further comprising a trunnion disposed between the cutting assembly and the base, said trunnion being constructed so as to permit the cutting assembly to bevel with respect to the base.
6. The miter saw of claim 1, further comprising a turntable pivotally mounted to the base, said turntable being constructed so as to rotate the cutting assembly with respect to the workpiece positioning fence.
7. The miter saw of claim 1, wherein the miter saw is at least one of a chop-type miter saw and a sliding miter saw.

8. A saw, comprising:
 - a base having a support surface for at least partially supporting a workpiece;
 - a workpiece positioning fence coupled to the base, said positioning fence being orientated substantially perpendicular to the support surface for positioning a workpiece on a side of the fence; and
 - a cutting assembly pivotally mounted on the saw to achieve a full-cut position, said cutting assembly including a motor configured to rotate a circular saw blade having a radius,

wherein the periphery of the saw blade is substantially equal to the interface between the support surface and the positioning fence, on the workpiece positioning side, when the cutting assembly is disposed in a full-cut position.
9. The saw of claim 8, wherein the intersections of the saw blade and a plane extending through the support surface, when the cutting assembly is in the full-cut position, is of a length greater than 75% (seventy-five percent) of the diameter of the saw blade.
10. The saw of claim 8, wherein the intersections of the saw blade and a plane extending through the support surface, when the cutting assembly is in the full-cut position, is of a length of approximately 77% (seventy-seven percent) of the diameter of the saw blade.
11. The saw of claim 8, further comprising a turntable pivotally mounted to the base, said turntable being constructed so as to rotate the cutting assembly with respect to the workpiece positioning fence.
12. The saw of claim 8, further comprising a trunnion disposed between the cutting assembly and the base, said trunnion being constructed so as to permit the cutting

assembly to bevel with respect to the base.

13. The saw of claim 8, wherein the saw is at least one of a chop saw, a miter saw, and a beveling miter saw.
14. The saw of claim 8, wherein the cutting assembly includes gear assembly having a helical gear set coupled to the motor and a bevel gear set between the helical gear set and an arbor for rotating the circular saw blade.
15. The saw of claim 8, wherein the motor is orientated substantially parallel to a plane encompassing the circular saw blade.
16. The saw of claim 15, further comprising a gear box coupling the motor and the saw blade, wherein the gear box is tapered in the direction of the base.

17. A saw, comprising:
 - a base having a support surface for at least partially supporting a workpiece;
 - a workpiece positioning fence coupled to the base, said positioning fence being orientated substantially perpendicular to the support surface; and
 - a cutting assembly pivotally mounted on the saw to achieve a plurality of positions, said cutting assembly including:
 - a motor orientated substantially perpendicular to an arbor for rotating a circular saw blade; and
 - a jack shaft having a first end with a helical gear and a second end having a bevel gear, said jack shaft being configured to transfer the rotational energy from the motor to the arbor,
- wherein the arbor includes a bevel gear for mechanically coupling with the bevel gear included on the jack shaft.
18. The saw of claim 17, further comprising a turntable coupled to the base, said turntable being configured to adjust the angular orientation of the saw blade with respect to a positioning fence.
19. The saw of claim 17, further comprising a trunnion disposed between the support and the saw base for beveling the saw blade with respect to the support surface.
20. The saw of claim 17, wherein the cutting assembly pivot point is further away from the base than the center of rotation of the saw blade when the mounting arm is parallel to the base.
21. The saw of claim 17, wherein the saw is at least one of a chop saw, a chop-type miter saw, a sliding miter saw, and a beveling miter saw.
22. The saw of claim 17, further comprising a gear box coupling the motor and the saw

blade, wherein the gear box is tapered in the direction of the base.

23. The saw of claim 22, further comprising a flange for securing the circular saw blade to the arbor, wherein the gear box terminates adjacent the flange.

24. A miter saw, comprising:

a base having a support surface for at least partially supporting a workpiece;
a workpiece positioning fence coupled to the base, said positioning fence being
orientated substantially perpendicular to the support surface;
a turntable pivotally mounted to the base, said turntable being constructed so as to
rotate with respect to the workpiece positioning fence; and
a cutting assembly pivotally mounted to the turntable so as to achieve a plurality of
positions, said cutting assembly including:
a motor orientated substantially perpendicular to an arbor for rotating a circular
saw blade; and
a gear assembly configured and arranged to transfer the rotational energy of the
motor to the arbor,
wherein the gear assembly and motor are configured so as to not contact the
workpiece position fence when the cutting assembly is disposed at the cutting
assembly's closest position to the base when mitering at 45° (forty-five degrees)
from a plane substantially perpendicular to the workpiece positioning fence.

25. The miter saw of claim 24, further comprising a trunnion disposed between the cutting assembly and the turntable, said trunnion being constructed so as to permit the cutting assembly to bevel with respect to the base.
26. The miter saw of claim 24, wherein the periphery of the saw blade is substantially equal to the interface between the support surface and the positioning fence, on the workpiece positioning side, when the cutting assembly is disposed in a full-cut position.
27. The miter saw of claim 24, wherein the gear assembly includes a helical gear set coupled to the motor and a bevel gear set between the helical gear set and the arbor.

28. The miter saw of claim 24, wherein the gear assembly includes a helical gear set coupled to the motor and a jack shaft extending between the helical gear set and a bevel gear set coupled to the arbor.
29. The miter saw of claim 24, further comprising a gear box coupling the motor and the circular saw blade, wherein the gear box is tapered in the direction of the base.
30. The miter saw of claim 24, wherein the cutting assembly pivot point is further away from the base than the center of rotation of the circular saw blade when the mounting arm is parallel to the base.

33. A miter saw, comprising:
 - a base having a support surface for at least partially supporting a workpiece;
 - a workpiece positioning fence coupled to the base, said positioning fence being orientated substantially perpendicular to the support surface for positioning a workpiece on a side of the fence; and
 - means for cutting a workpiece, said cutting means being configured to obtain a full-cut position wherein the cutting means is approximately equal to the interface between the support surface and the positioning fence.
34. The miter saw of claim 33, wherein the cutting means configured so as to not contact the workpiece position fence when mitering at 45° (forty-five degrees) from a plane substantially perpendicular to the workpiece positioning fence.
35. The miter saw of claim 33, wherein the cutting means is additionally configured to bevel with respect to the base.